Landsat Goings-On at the National Agriculture Statistics Service

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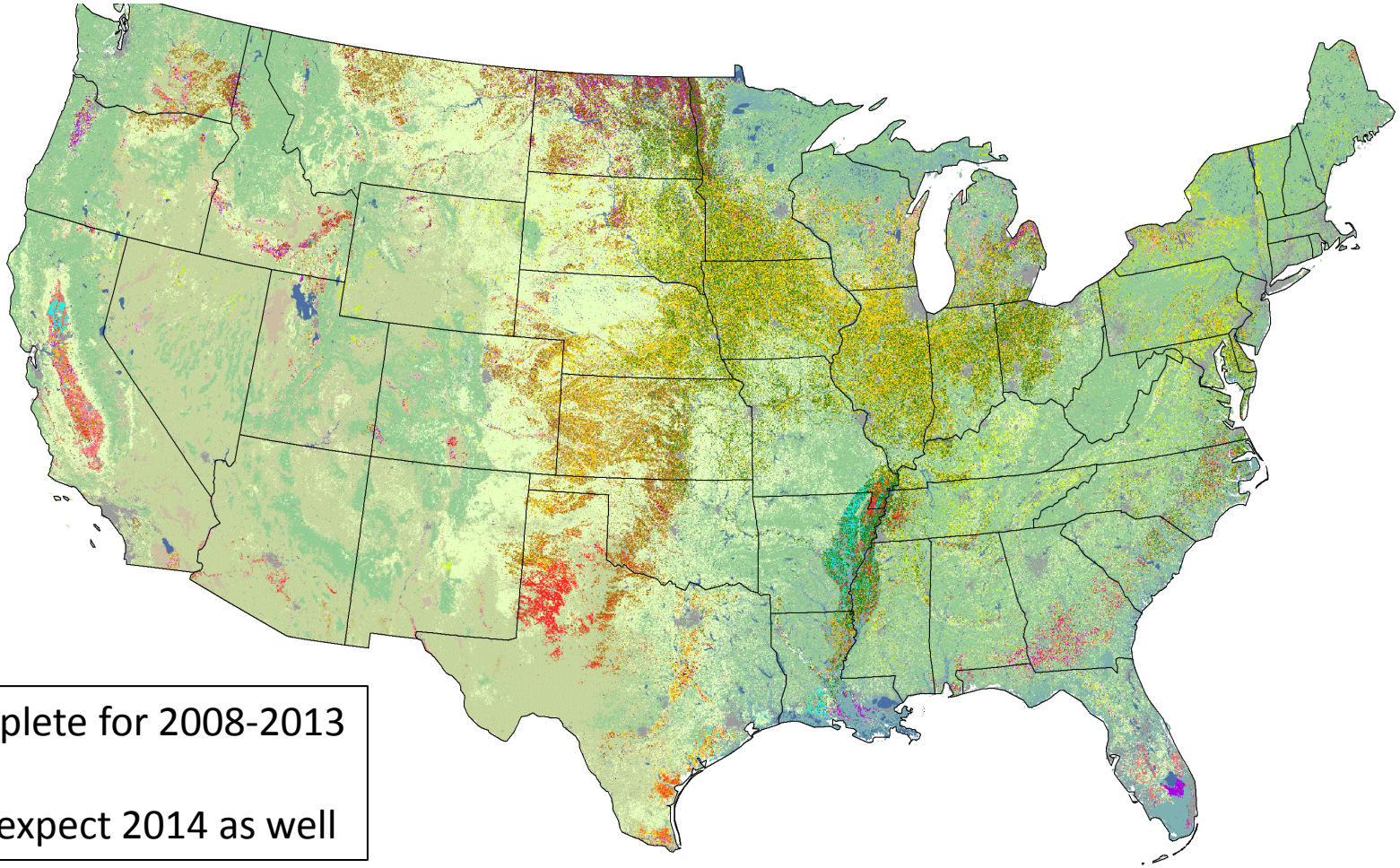
Landsat Science Team Meeting
Corvallis, Oregon
July 23, 2014

Cropland Data Layer (CDL)

Crop specific land cover classification for the USA



Complete for 2008-2013

Can expect 2014 as well

Major Land Cover Categories

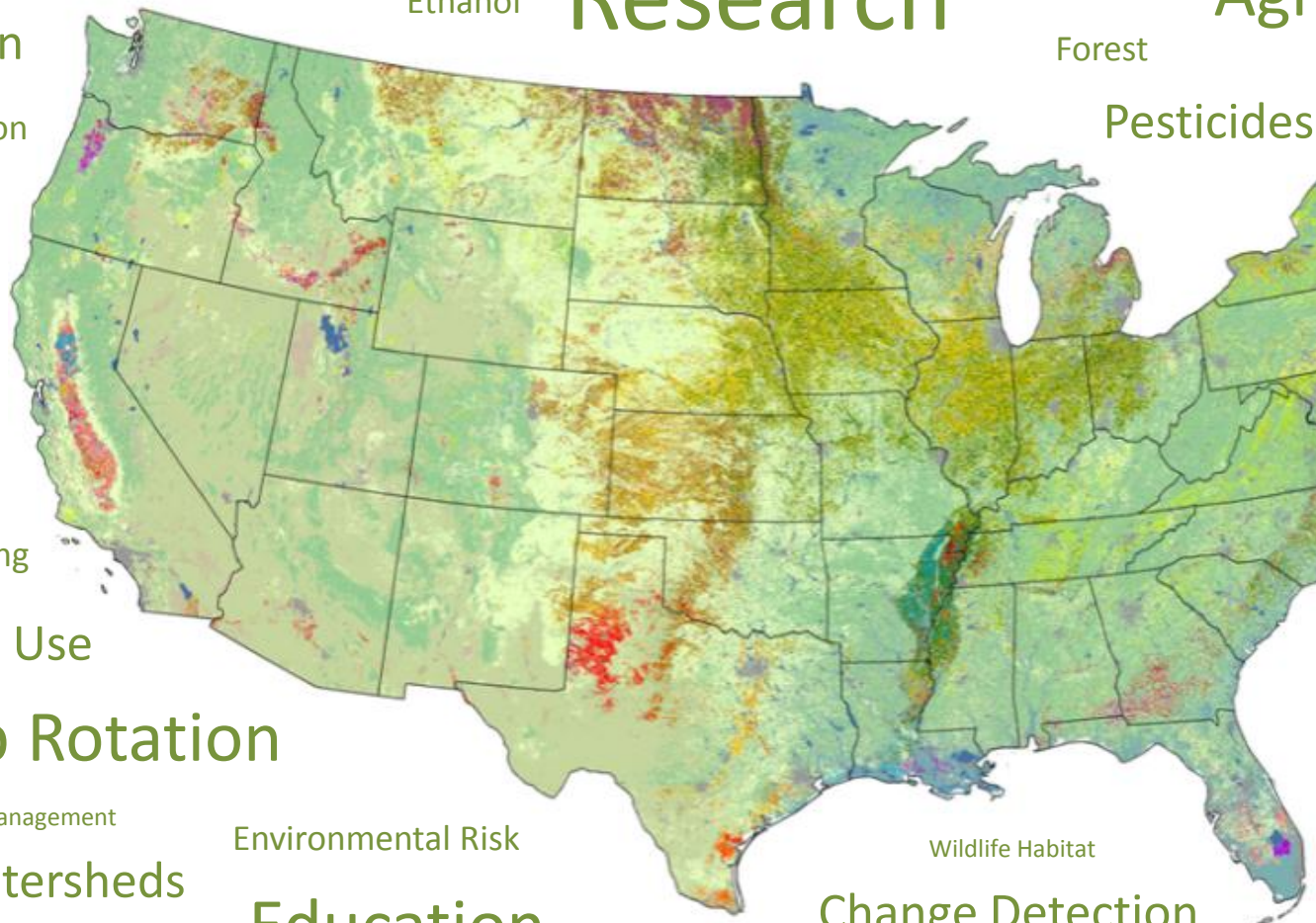
Agriculture

- Pasture/Grass
- Corn
- Soybeans
- All Wheat
- Other Hay
- Fallow/Idle Cropland
- Alfalfa
- Cotton
- Other Crops
- Vegetables/Fruits/Nuts
- Sorghum
- Other Small Grains
- Rice

Non-Agriculture

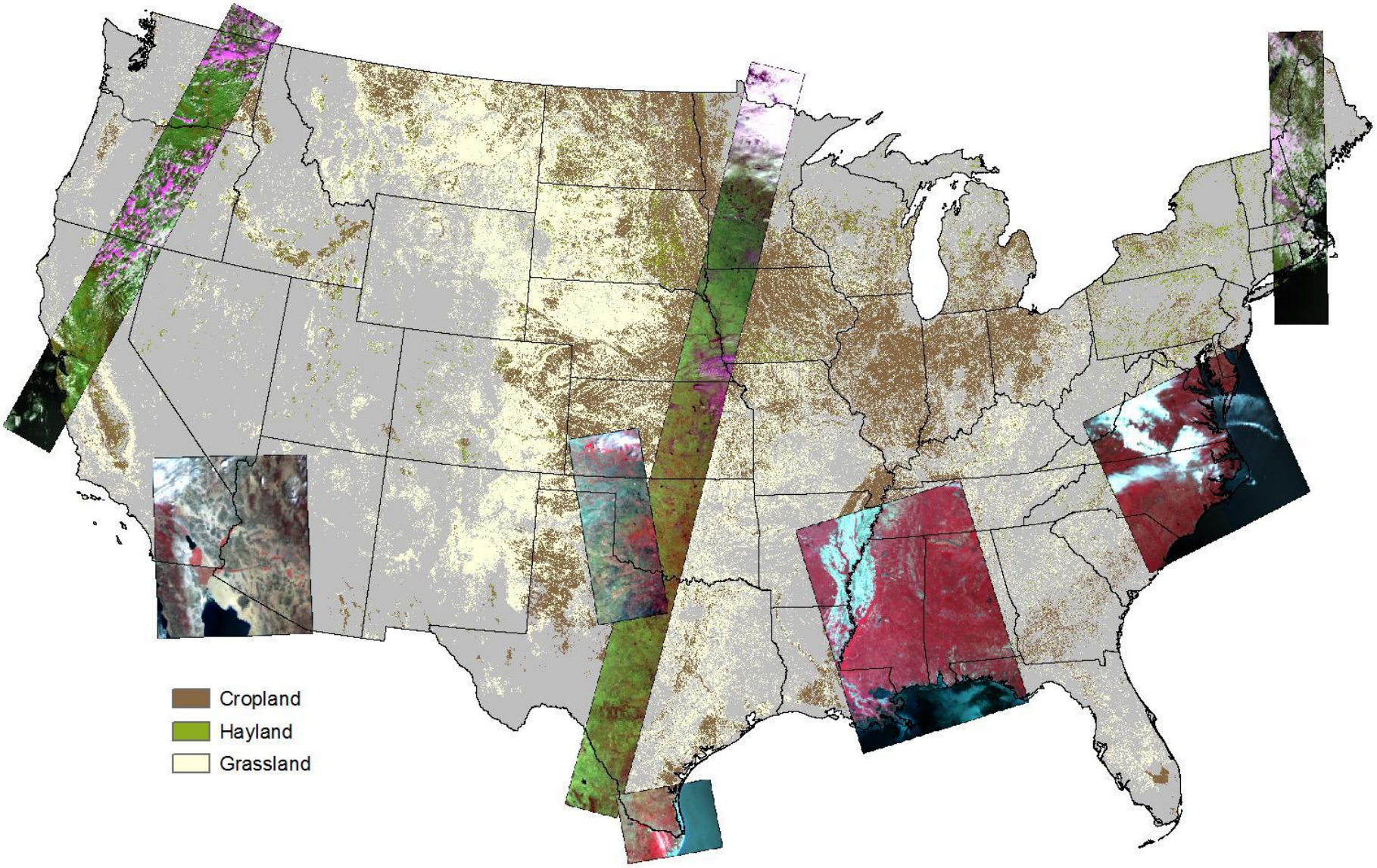
- Woodland
- Shrubland
- Urban/Developed
- Wetlands
- Water
- Barren
- Perennial Ice/Snow

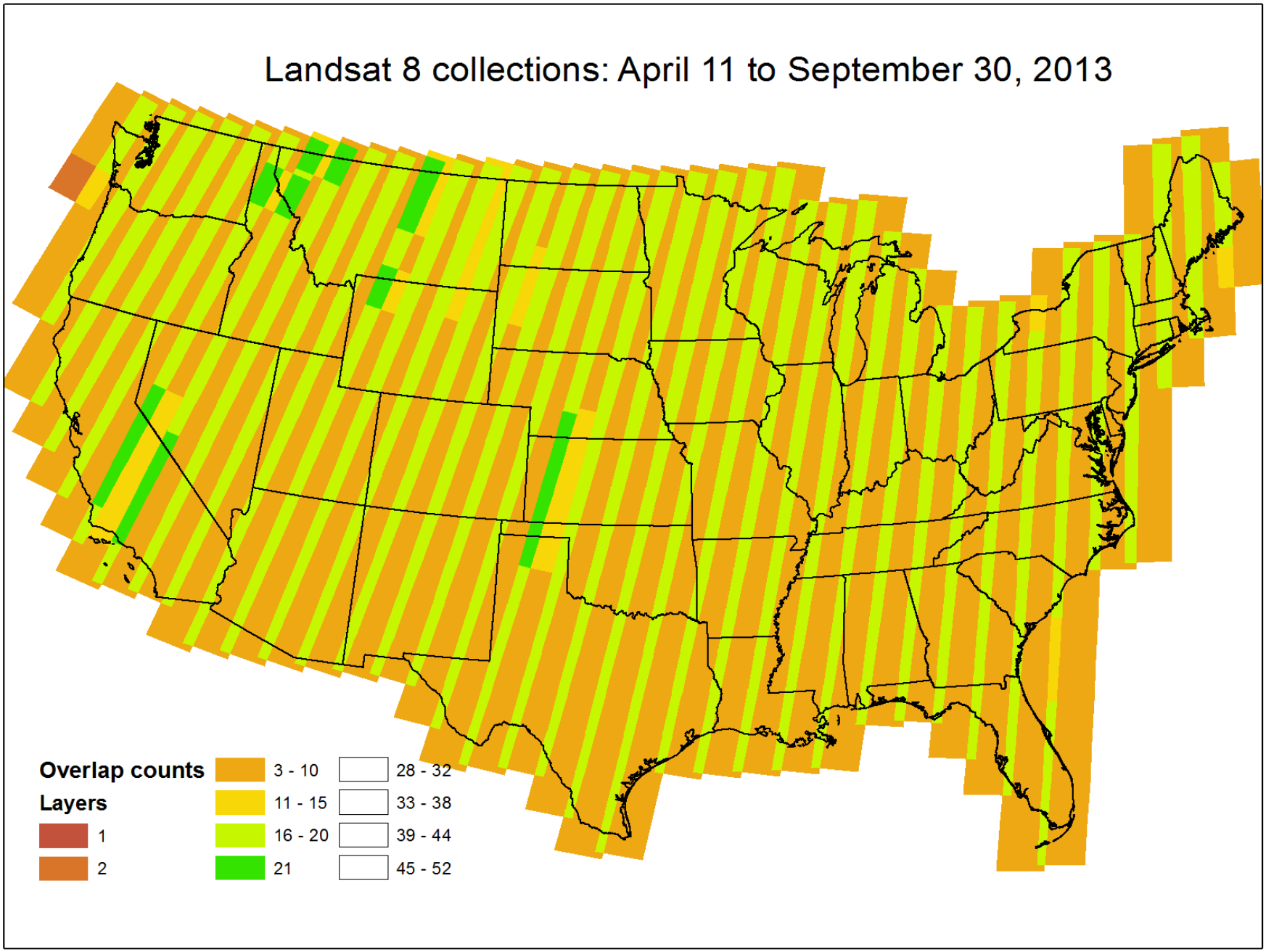
NASS Cropland Data Layer known applications

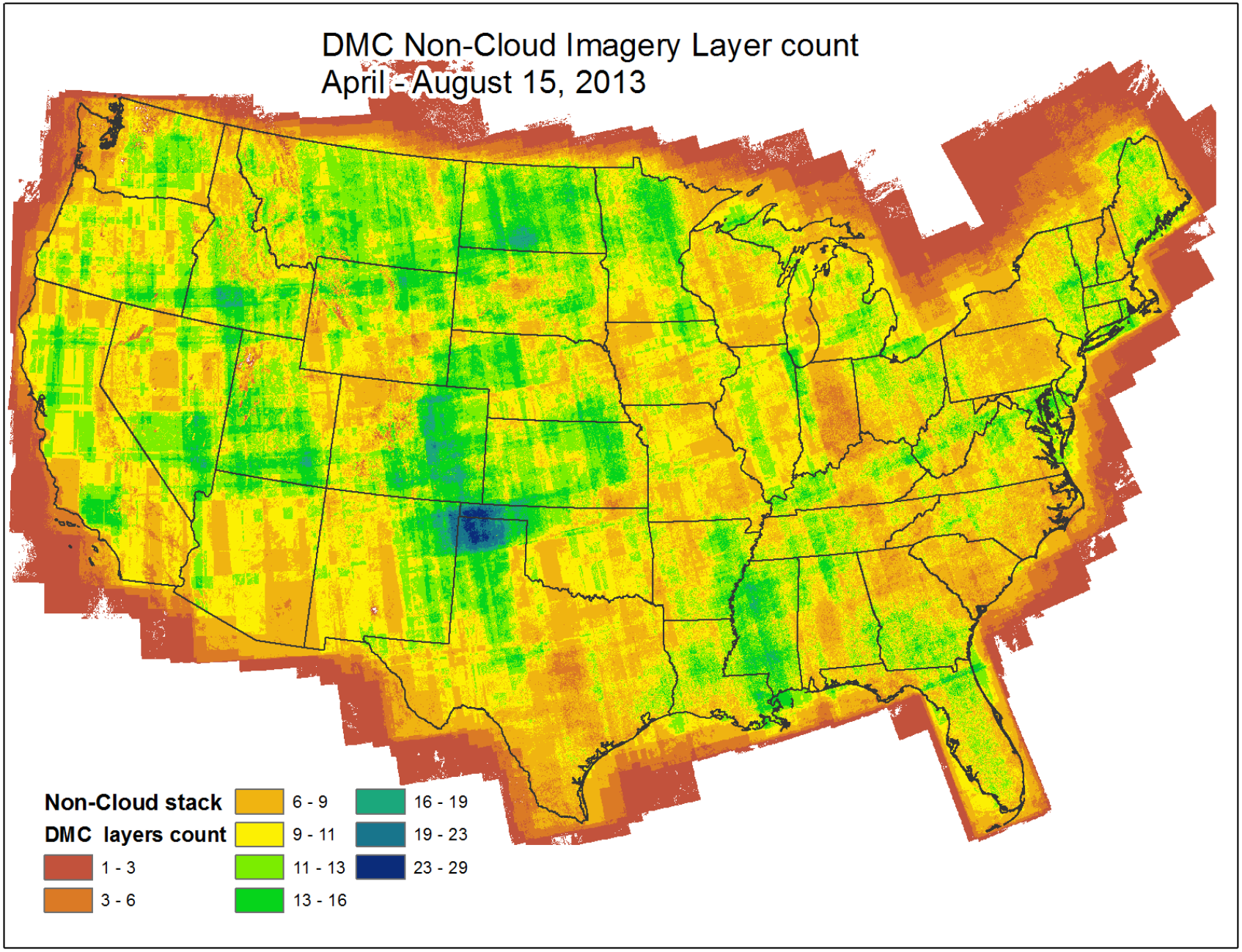


Climate
Acreage Estimates
Modeling
Irrigation
Epidemiology
Land Cover
Soil Utilization
Ethanol
Research
Pest Control
Agribusiness
Carbon
Forest
Biodiesel
Erosion
Pesticides
Ecology
Fertilizer
Yield
Biofuel
CRP
Land Use
Ecosystem
Commodity
Planning
Urban Growth
Water Use
Soil and Water
Crop Rotation
Fertilizer Usage
Crop Intensity
Land Management
Environmental Risk
Wildlife Habitat
Water Quality
Watersheds
Education
Change Detection
Mapping
Transportation
Data Mining
Condition Assessment
Disaster Assessment
Crop Production
Crop Protection

L8 & DMC collects May 5, 2014

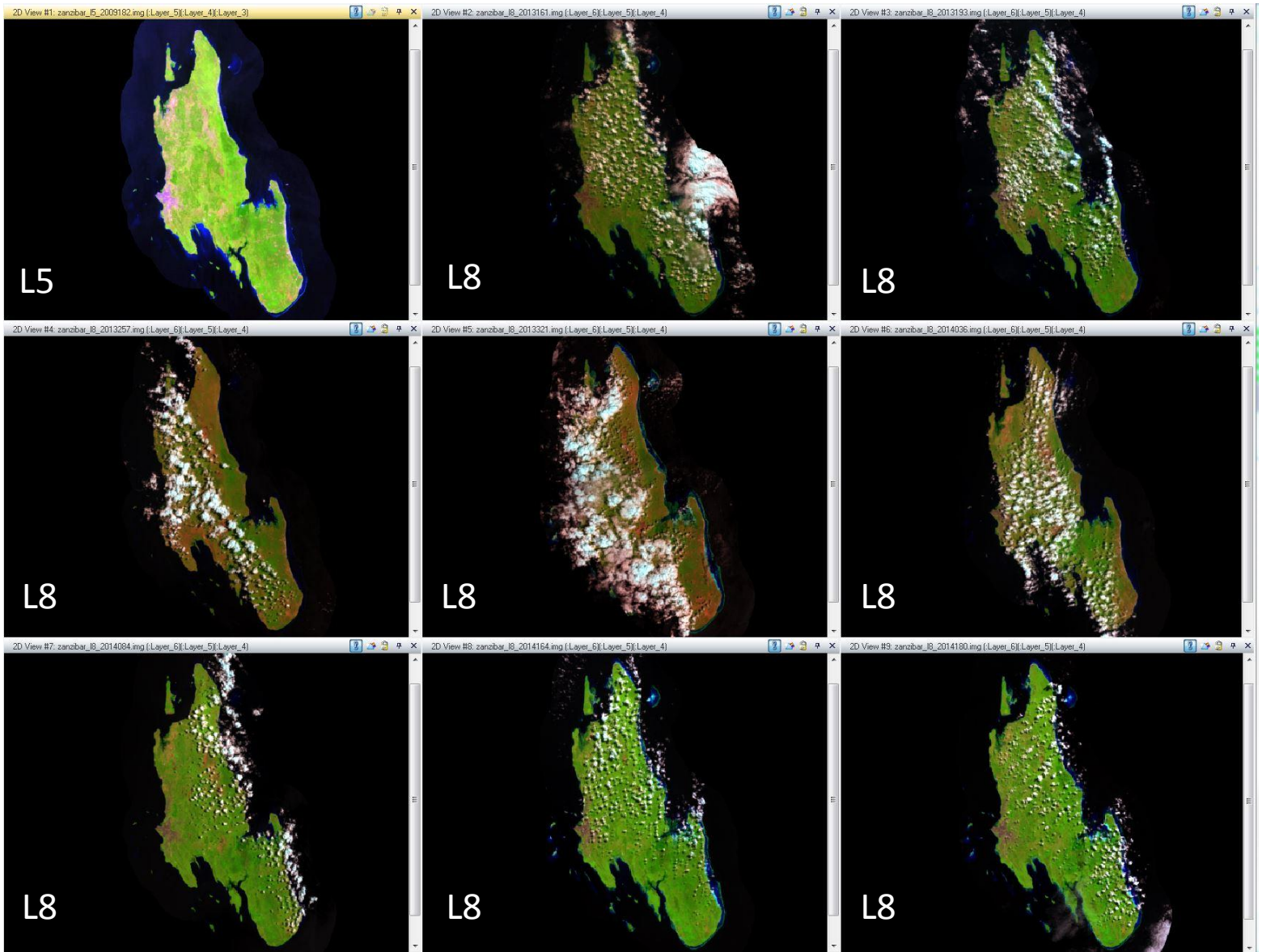


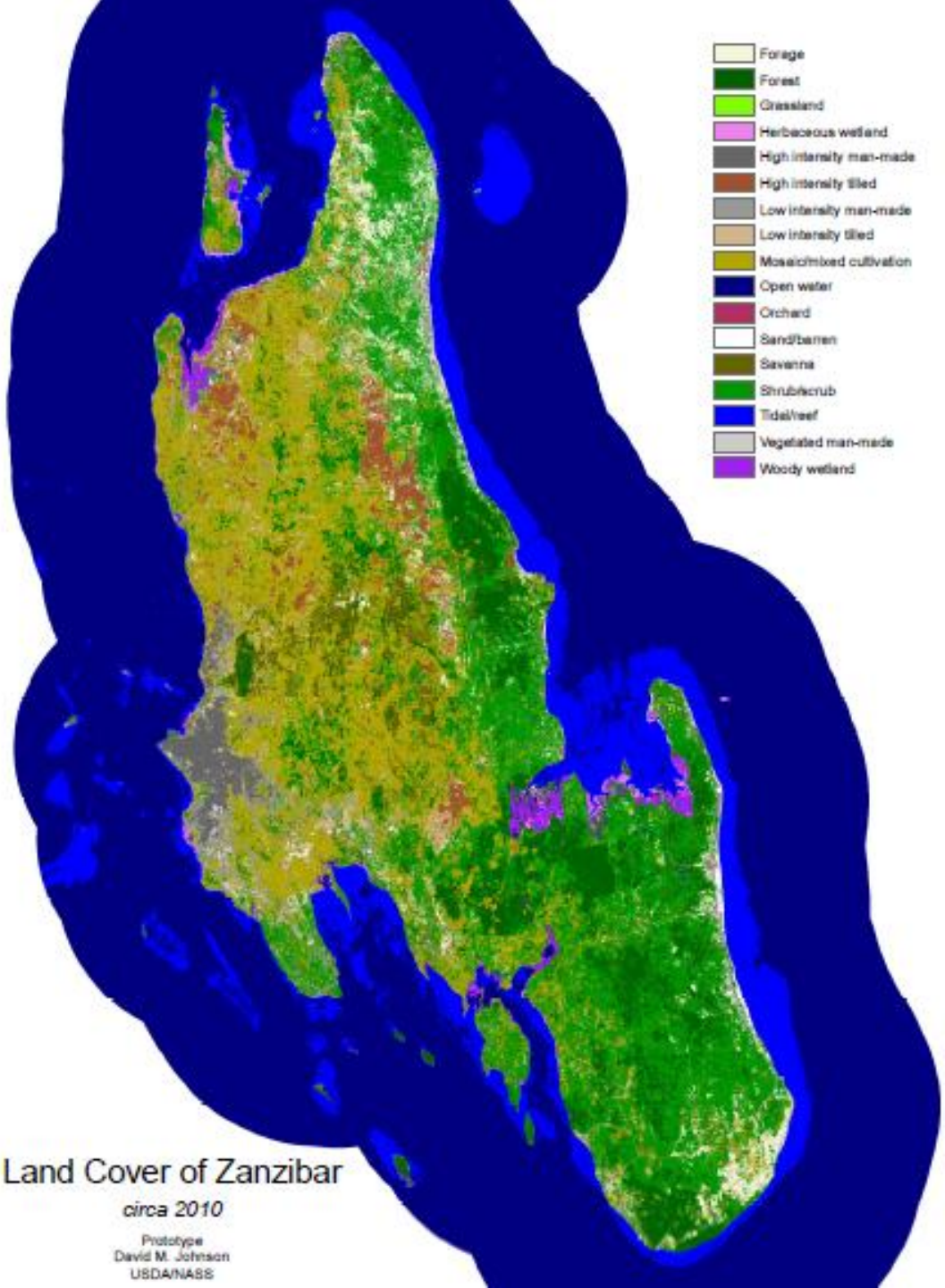

Landsat 8 collections: April 11 to September 30, 2013
Overlap counts
Layers
1
2
3 - 10
11 - 15
16 - 20
21
28 - 32
33 - 38
39 - 44
45 - 52

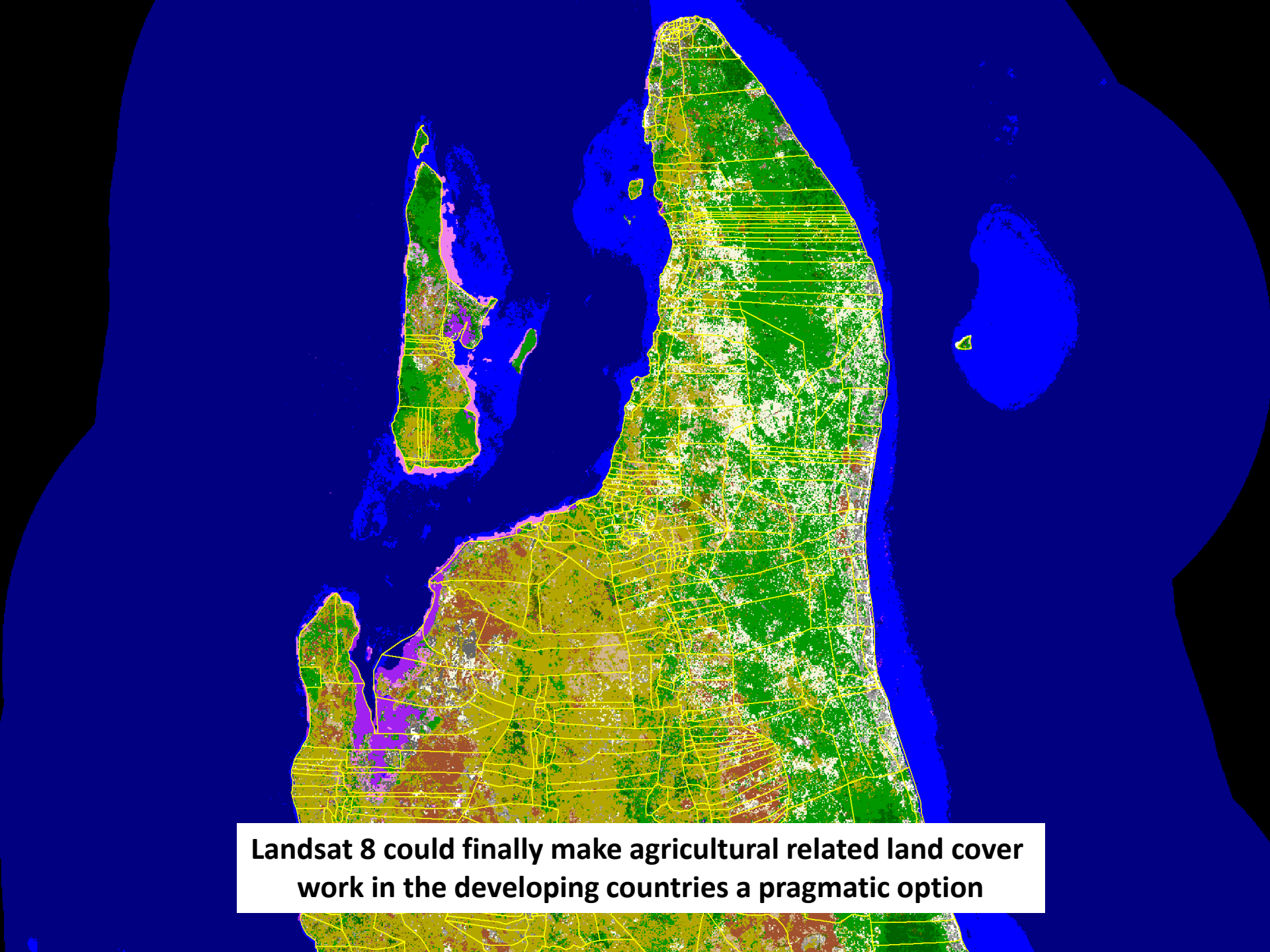


The DMC scene location/size randomness makes for better looking classifications overall

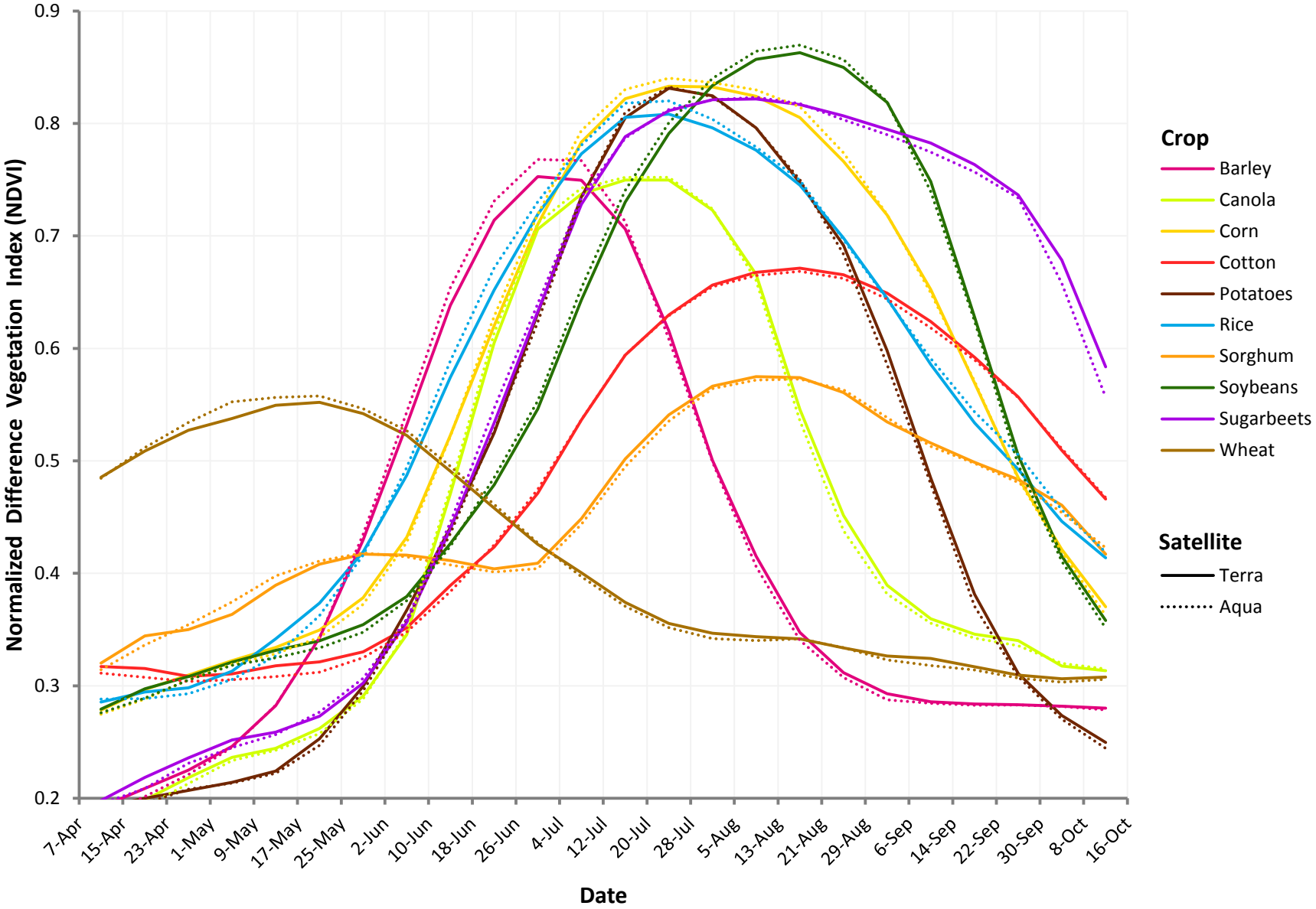
Land cover mapping abroad to improve agricultural survey sampling efficiency

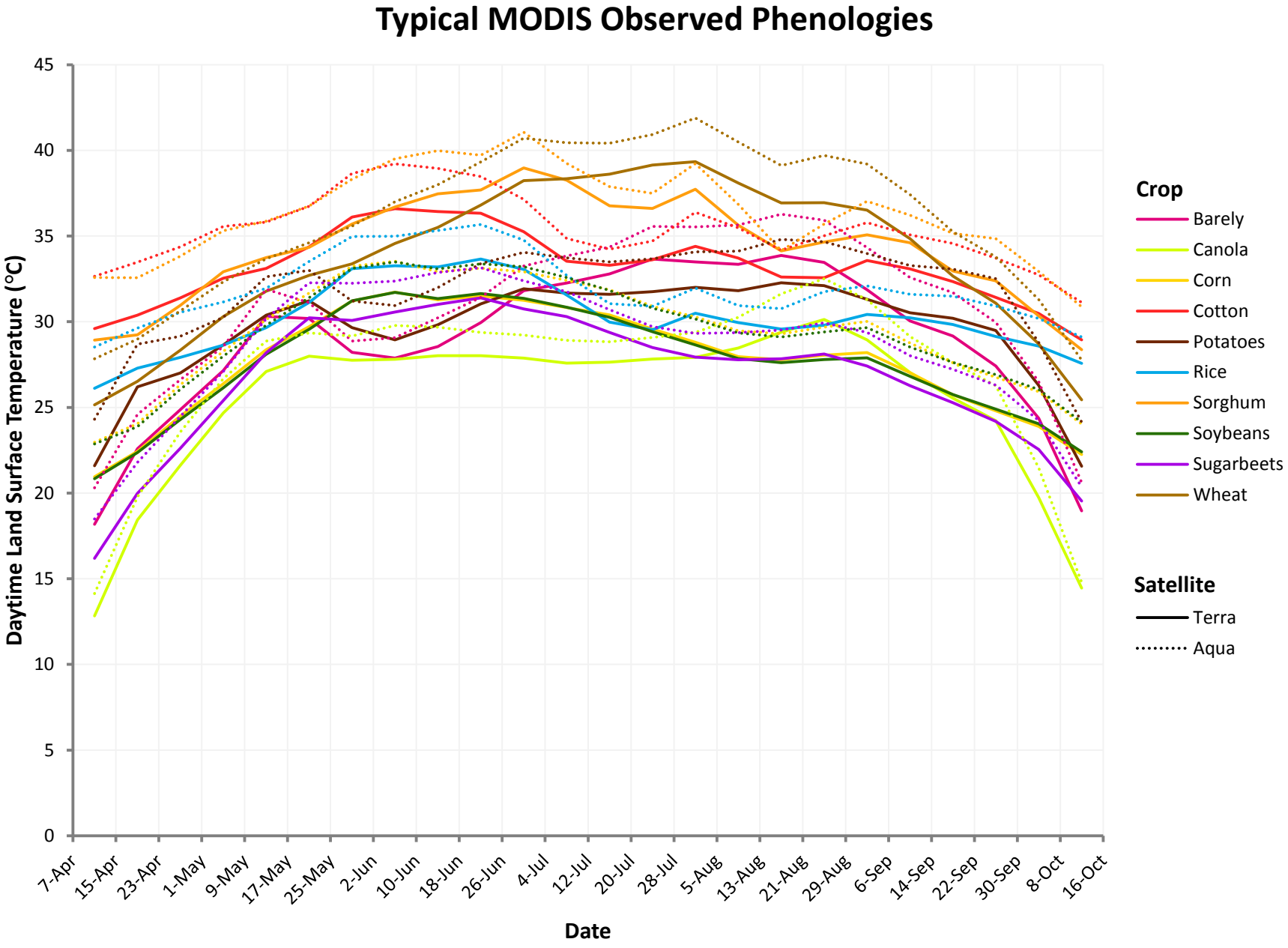



Forage
Forest
Grassland
Herbaceous wetland
High intensity man-made
High intensity tilled
Low intensity man-made
Low intensity tilled
Mosaic/mixed cultivation
Open water
Orchard
Sand/barren
Savanna
Shrub/scrub
Tidal/reef
Vegetated man-made
Woody wetland
Land Cover of Zanzibar
circa 2010
Prototype
David M. Johnson
USDA/NASS

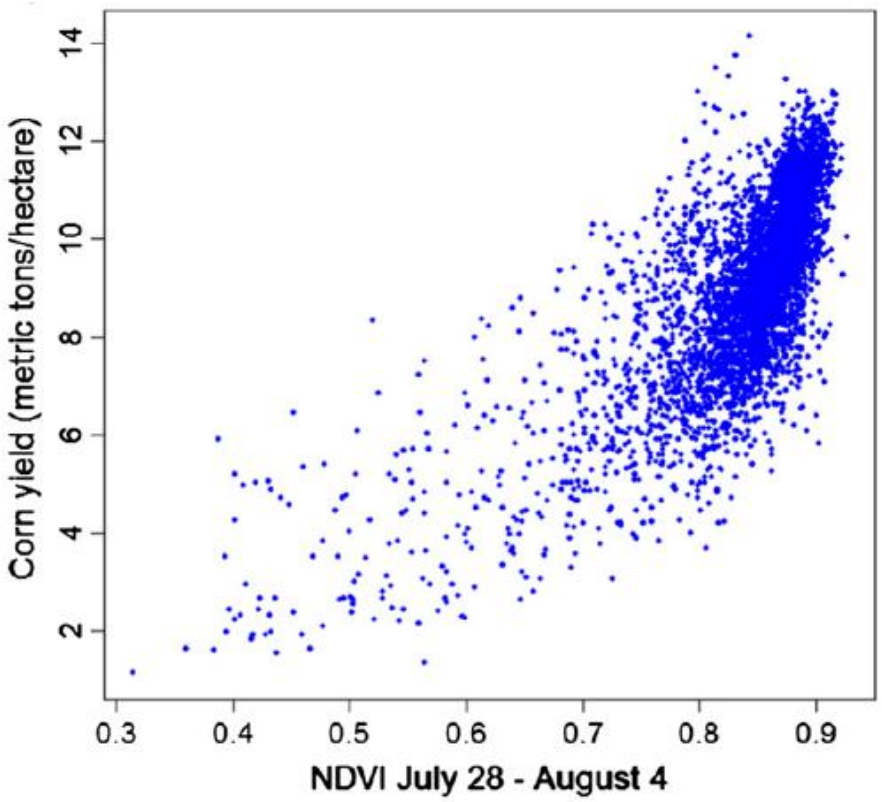


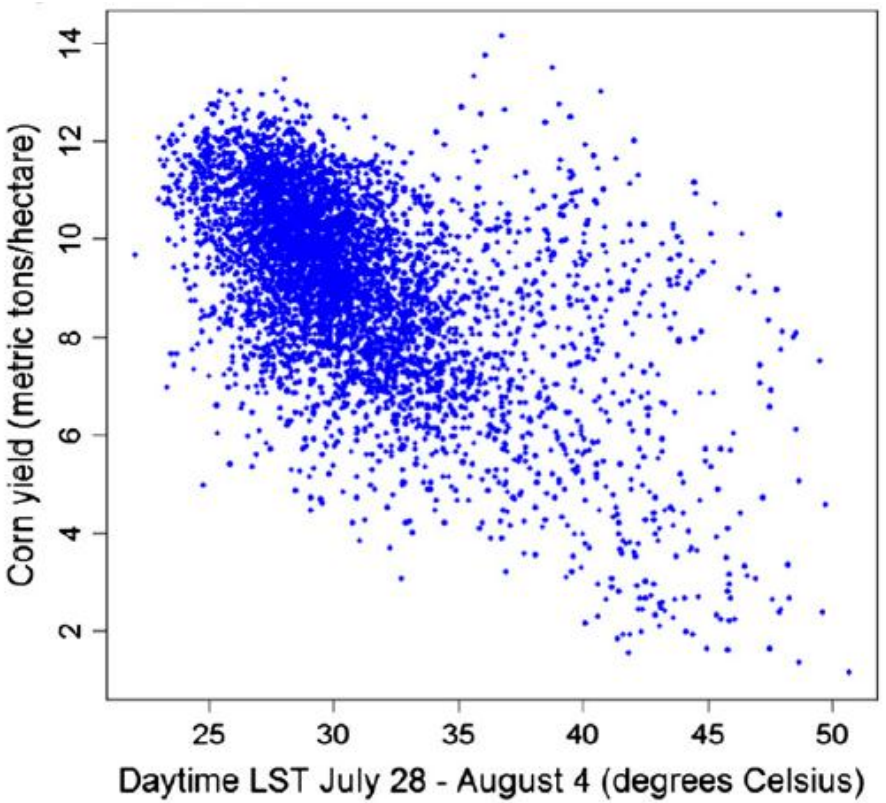
Landsat 8 could finally make agricultural related land cover work in the developing countries a pragmatic option


Typical MODIS Observed Phenologies
Normalized Difference Vegetation Index (NDVI)
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
7-Apr
15-Apr
23-Apr
1-May
9-May
17-May
25-May
2-Jun
10-Jun
18-Jun
26-Jun
4-Jul
12-Jul
20-Jul
28-Jul
5-Aug
13-Aug
21-Aug
29-Aug
6-Sep
14-Sep
22-Sep
30-Sep
8-Oct
16-Oct
Date
Crop
Barley
Canola
Corn
Cotton
Potatoes
Rice
Sorghum
Soybeans
Sugarbeets
Wheat
Satellite
Terra
Aqua

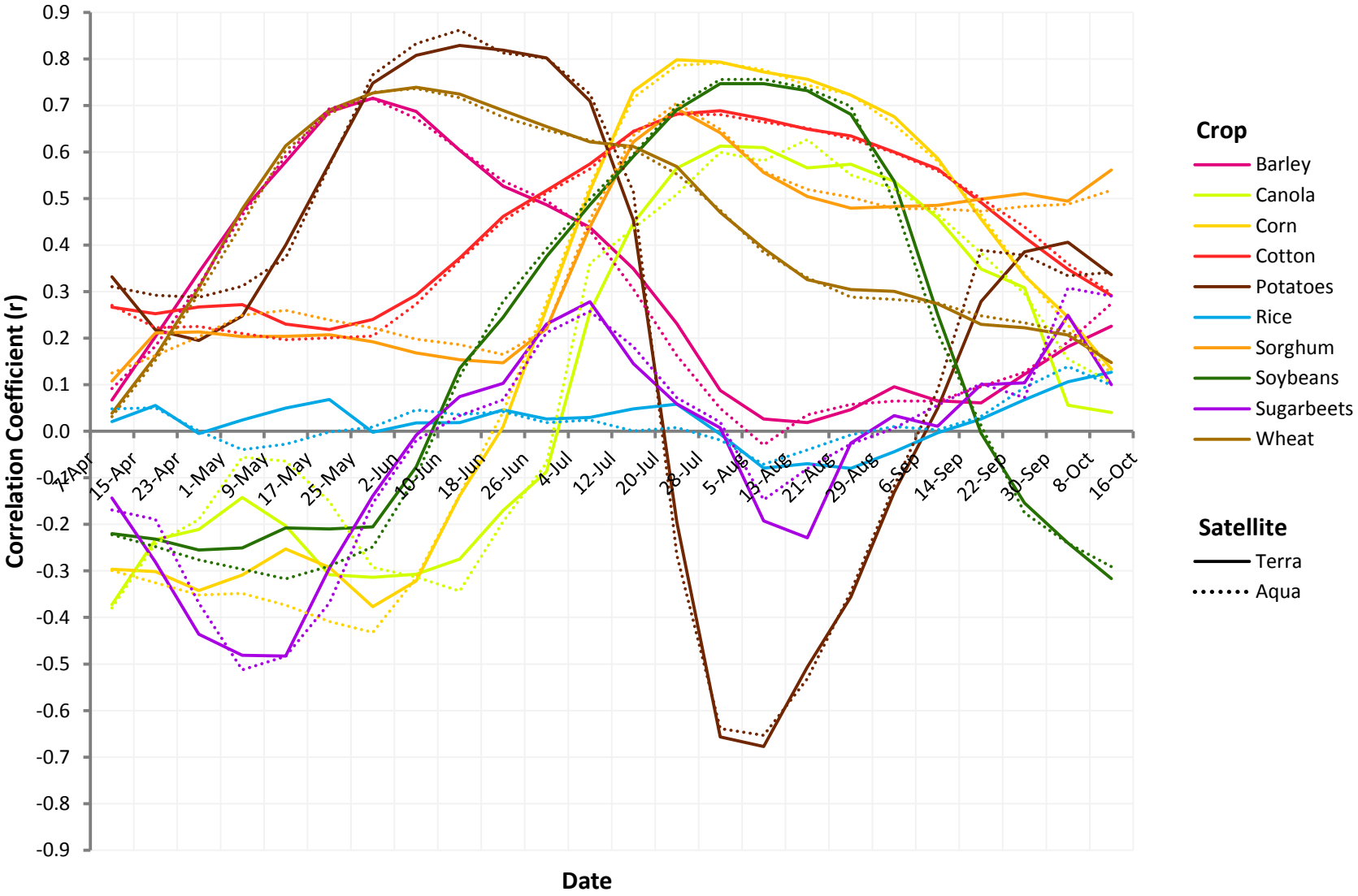

Typical MODIS Observed Phenologies
Daytime Land Surface Temperature (°C)
45
40
35
30
25
20
15
10
5
0
7-Apr
15-Apr
23-Apr
1-May
9-May
17-May
25-May
2-Jun
10-Jun
18-Jun
26-Jun
4-Jul
12-Jul
20-Jul
28-Jul
5-Aug
13-Aug
21-Aug
29-Aug
6-Sep
14-Sep
22-Sep
30-Sep
8-Oct
16-Oct
Date
Crop
Barely
Canola
Corn
Cotton
Potatoes
Rice
Sorghum
Soybeans
Sugarbeets
Wheat
Satellite
Terra
Aqua

The relationships (mid summer) to crop yields

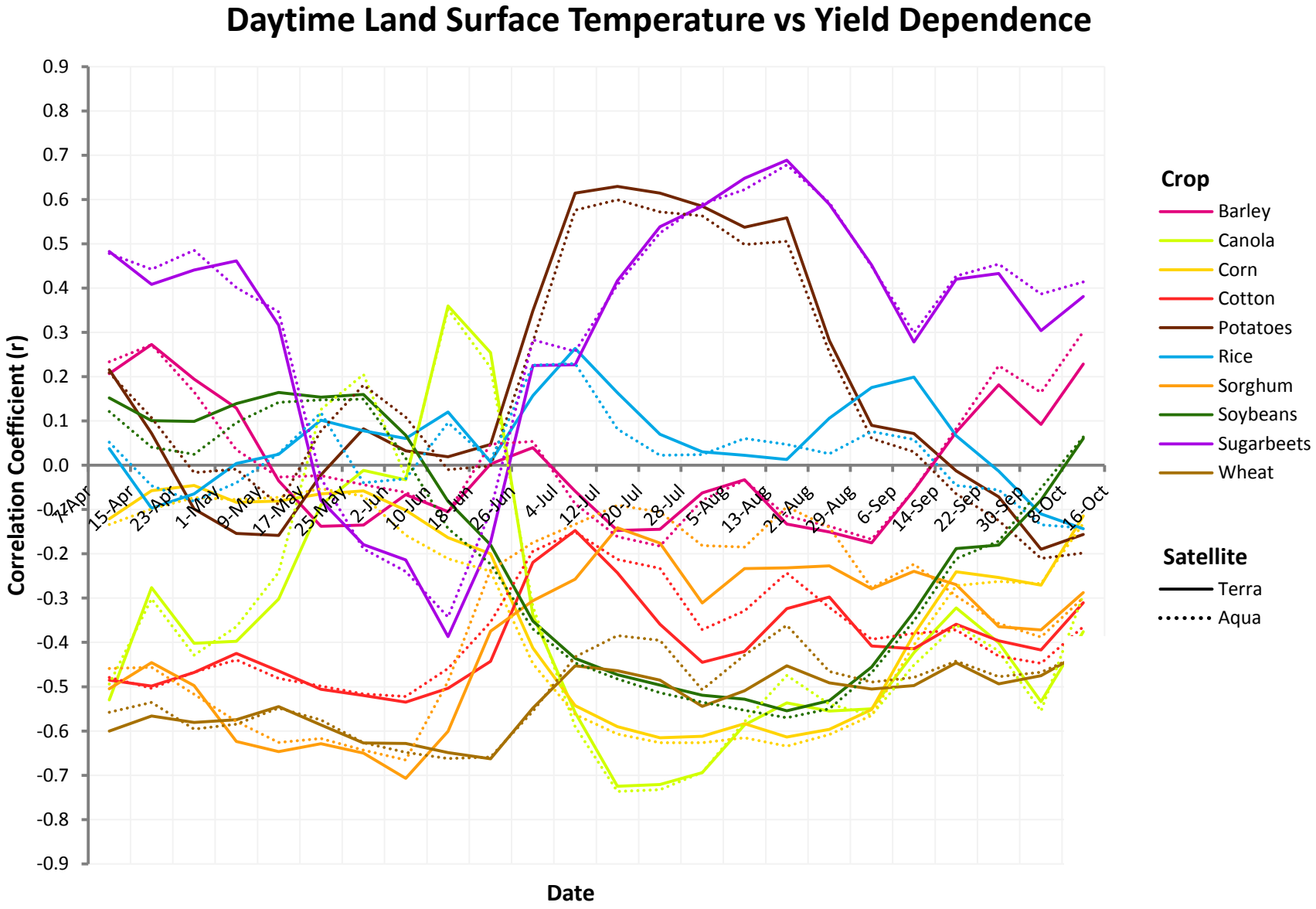




NDVI vs Yield Dependence



Fairly strong positive relationship at some point during the growing season for most crops



There are also relationships (positive or negative) to Land Surface Temperature for some crops


4’ 59.37”
Thanks